SECOND PRELIMINARY AMENDMENT

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original): A method for carrying out a comprehensive quality control of a MOX fuel rod, comprising a combination of operations selected from :

measuring a plutonium content of pellets contained in said rod,

checking for rogue pellets in said rod,

checking internal structure and constituents in said rod,

measuring dimensional characteristics of said rod

measuring radioactive contamination along a surface of said rod, and

checking conformity of a rod identity with plutonium enrichment,

characterized by :

moving the fuel rod axially,

performing concurrently said measurements and checks along the fuel rod moved axially, and

using radiometry, and/or radiography and/or electro-optical identification for said control.

2. (original): The method, as claimed in claim 1, characterized by moving continuously said fuel rod at constant speed during said measurements and checks.

3. (previously presented): The method, as claimed in claim 1, characterized by simultaneously measuring the plutonium content and checking for rogue pellets through

scanning of the native gamma radiation emitted by the plutonium and americium contained in the pellets with a single, or a plurality of, NaI and/or CdTe detector(s).

4. (previously presented): The method, as claimed in claim 1, characterized by simultaneously measuring the plutonium content and detecting rogue pellets through scanning of the gamma radiation emitted by the plutonium contained in the pellets after activation by thermalized neutrons from a ^{252}Cf or $^{241}AmLi$ source, the measuring being performed with a single, or a plurality of, NaI and/or CdTe detector(s).

5. (previously presented): The method, as claimed in claim 3, characterized by simultaneously

detecting said gamma radiation with the plurality of detectors, the signals of which being discriminated with several energy windows,

temporally shifting the said delivered signals, and

summing the shifted signals.

6. (previously presented): The method, as claimed in claim 1, characterized by simultaneously

checking the internal structure through subjecting the rod to an external ^{241}Am or ^{137}Cs gamma source, and

scanning the traversing gamma radiation with a single gamma detector.

7. (previously presented): The method, as claimed in claim 1, characterized by simultaneously measuring an external alpha contamination through a single annular detector without contacting the fuel rod.

8. (previously presented): The method, as claimed in claim 1, characterized by simultaneously checking conformity of a rod identity with the plutonium content through electro optical reading or image processing of identification code(s).

9. (original): The method as claimed in claim 1, characterized in that moving the fuel rod is carried out by using two independent but strictly synchronized driving mechanisms, one located at a feed end and one at an exit end of a rod scanning apparatus designed for said method, so as to insure a constant progression of the fuel rod through the apparatus from one end plug of the fuel rod to, said two mechanisms being spaced at a distance shorter than the length of the rod.

10 (original): An apparatus for carrying out said comprehensive MOX fuel rod quality control method according to claim 1, ***characterized by*** :

means for moving the fuel rod axially at constant speed, comprising at least two independent but strictly synchronized driving mechanisms, one located at feed end and one at an exit end of the rod control apparatus,

a series of measuring and checking systems aligned along the path of travel of said fuel rod and operating concurrently, and

said systems being selected from a group comprising radiometry, radiography and electro optical identification systems.

11. (original): The apparatus according to claim 10 characterized by a single or a plurality of NaI and/or CdTe detectors for measuring the plutonium content and detecting rogue pellets by scanning the native gamma radiation emitted by the plutonium and americium contained in the pellets.

12. (original): The apparatus according to claim 10 characterized in that, for measuring the plutonium content and detecting rogue pellets, said apparatus comprises :

a ^{252}Cf or $^{241}AmLi$ source of thermalized neutrons for activation of the plutonium, and

a single or a plurality of NaI and/or CdTe detectors for the scanning of the gamma radiation emitted by the activated plutonium contained in the pellets.

13. (previously presented): The apparatus according to claim 11 characterized by a single or a plurality of annular detectors for measuring the plutonium content and detecting rogue pellets.

14. (previously presented): The apparatus according to claim 11, characterized by a plurality of energy discriminators and means for summing temporally shifted γ - counts.

15. (original): The apparatus according to claim 10 characterized in that, for checking the internal structure and constituents of the rod, said apparatus comprises :

an external ^{241}Am or ^{137}Cs source of gamma radiation, and

a single gamma detector for scanning of the gamma radiation traversing the fuel rod.

16. (original): The apparatus according to claim 10 characterized in that, for measuring radioactive contamination of cladding along the rod, said apparatus comprises :

a single or a plurality of annular alpha detectors for scanning of the alpha radiation emitted by an external surface of the fuel rod.

17. (new): The apparatus according to claim 12, characterized by a single or a plurality of annular detectors for measuring the plutonium content and detecting rogue pellets.

18. (new): The apparatus according to claim 12, characterized by a plurality of energy discriminators and means for summing temporally shifted γ - counts.